



**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Apparatus for processing data, said apparatus comprising:  
processing logic operable to perform processing operations under control of  
program instructions and subject to interruption by a plurality of interrupt events; and  
a nested interrupt controller operable to control nested execution of a plurality of  
active interrupt handling programs that are started and uncompleted and which is responsive to  
priorities associated with respective ones of said plurality of interrupt handling programs to  
control pre-emption of ~~one or more~~ said plurality of active interrupt handling programs by a  
pending interrupt handling program; wherein:

a priority of a given active interrupt handling program is alterable whilst said  
given active interrupt handling program is started and uncompleted such that a currently  
executing interrupt handling program does not have a highest priority of said plurality of active  
interrupt handling programs; and

    said nested interrupt controller is ~~operable~~ responsive to an interrupt event for a  
pending interrupt handling program:

    (i) to permit said pending interrupt handling program to pre-empt ~~a~~ said plurality of  
    active interrupt handling programs if a priority associated with said pending interrupt handling  
    program is higher than a highest priority associated with any of said plurality of active interrupt  
    programs as determined with respect to all of said plurality of active interrupt handling  
programs; and

(ii) to prevent said pending interrupt handling program from pre-empting said plurality of active interrupt handling programs if said priority associated with said pending interrupt handling program is less than said highest priority associated with any of said plurality of active interrupt handling programs as determined with respect to all of said plurality of active interrupt handling programs.

2. (Previously Presented) The apparatus as claimed in claim 1, wherein said nested interrupt controller is operable to prevent said pending interrupt handling program from pre-empting said plurality of active interrupt handling programs if said priority associated with said pending interrupt handling program is equal to a highest priority associated with any of said plurality of active interrupt handling programs.

3. (Previously Presented) The apparatus as claimed in claim 1, wherein a priority of an interrupt handling program is set by a programmable priority level associated with said interrupt handling program.

4. (Previously Presented) The apparatus as claimed in claim 1, wherein said pending interrupt handling program corresponds to one of:  
a newly detected interrupt event; and  
one or more previously detected interrupt event for which a corresponding interrupt handling program has not started execution.

5. (Previously Presented) The apparatus as claimed in claim 1, wherein said nested interrupt controller is responsive to stored values corresponding to respective ones of a plurality of interrupt events and indicative of:

a corresponding interrupt handling program being pending or active, and  
a priority level associated with said corresponding interrupt handling program.

6. (Previously Presented) The apparatus as claimed in claim 1, comprising stack data storage operable to store state data corresponding to processing pre-empted by one or more active interrupt handling programs.

7. (Previously Presented) The apparatus as claimed in claim 6, wherein said highest priority level associated with any of said plurality of active interrupt handling programs is increased when free space within said stack data store falls below a predetermined free space level.

8. (Previously Presented) The apparatus as claimed in claim 7, wherein said highest priority level associated with any of said plurality of active interrupt handling programs is increased to a programmable priority level which is less than a maximum possible priority level.

9. (Previously Presented) The apparatus as claimed in claim 8, wherein said predetermined free space level is set to leave free space within said stack memory for use during pre-emption by interrupt handling programs having a priority higher than said programmable priority level.

10. (Previously Presented) The apparatus as claimed in claim 7, comprising a plurality of processors within a multiprocessing system, said stack data storage being a shared hardware stack used for communication between said plurality of processors.

11. (Previously Presented) The apparatus as claimed in claim 6, wherein said stack data storage is a stack memory.

12. (Currently Amended) A method of processing data, said method comprising the steps of:

performing processing operations under control of program instructions, said processing operations being subject to interruption by a plurality of interrupt events; and controlling nested execution of a plurality of active interrupt handling programs that are started and uncompleted and in response to priorities associated with respective ones of said plurality of interrupt handling programs to control pre-emption of one or more a plurality of active interrupt handling programs by a pending interrupt event; wherein

a priority of a given active interrupt handling program is alterable whilst said given active interrupt handling program is started and uncompleted such that a currently executing interrupt handling program does not have a highest priority of said plurality of active interrupt handling programs; and

said step of controlling is operable responsive to an interrupt event for a pending interrupt handling program:

(i) to permit asaid pending interrupt handling program to pre-empt asaid plurality of active interrupt handling programs if a priority associated with said pending interrupt handling program is higher than a highest priority associated with any of said plurality of active interrupt programs as determined with respect to all of said plurality of active interrupt handling programs; and

(ii) to prevent said pending interrupt handling program from pre-empting said plurality of active interrupt handling programs if said priority associated with said pending interrupt handling program is less than said highest priority associated with any of said plurality of active interrupt handling programs as determined with respect to all of said plurality of active interrupt handling programs.

13. (Previously Presented) The method as claimed in claim 12, wherein said step of controlling is operable to prevent said pending interrupt handling program from pre-empting said plurality of active interrupt handling programs if said priority associated with said pending interrupt handling program is equal to a highest priority associated with any of said plurality of active interrupt handling programs.

14. (Previously Presented) The method as claimed in claim 12, wherein a priority of an interrupt handling program is set by a programmable priority level associated with said interrupt handling program.

15. (Previously Presented) The method as claimed in claim 12, wherein said pending interrupt handling program corresponds to one of:

a newly detected interrupt event; and  
one or more previously detected interrupt event for which a corresponding interrupt handling program has not started execution.

16. (Previously Presented) The method as claimed in claim 12, wherein said step of controlling is responsive to stored values corresponding to respective ones of a plurality of interrupt events and indicative of:

a corresponding interrupt handling program being pending or active, and  
a priority level associated with said corresponding interrupt handling program.

17. (Previously Presented) The method as claimed in claim 12, wherein stack data storage is operable to store state data corresponding to processing pre-empted by one or more active interrupt handling programs.

18. (Previously Presented) The method as claimed in claim 17, wherein said highest priority level associated with any of said plurality of active interrupt handling programs is increased when free space within said stack data store falls below a predetermined free space level.

19. (Previously Presented) The method as claimed in claim 18, wherein said highest priority level associated with any of said plurality of active interrupt handling programs is increased to a programmable priority level which is less than a maximum possible priority level.

20. (Previously Presented) The method as claimed in claim 19, wherein said predetermined free space level is set to leave free space within said stack memory for use during pre-emption by interrupt handling programs having a priority higher than said programmable priority level.